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Office Memorandum • UNITED STATES GOVERNMENT

TO : The Files - Contract 605

DATE: 26 August 1959

FROM :

[Redacted]

SUBJECT: Trip Report -

[Redacted]

1. On 17 August 1959, [Redacted] OC-E/R+D-EP, visited the [Redacted], for the purpose of monitoring progress on various antenna developments under contract 605.

2. Contract 605, Task 1, Inflatable Pouchable Antenna System. Work on this antenna system is almost completed. Five of the antennas are in the final stages of fabrication and certain portions of the systems have been boxed for shipment. One modification to the design of the inflatable bag's supporting structure was made. Thumb screws are now going to be provided with the ring structure to secure the locking levers on the ring segments. The use of these screws will prevent damage to the locking levers due to their catching on the quadripod as the antenna is rotated. An additional page will be supplied for the already-delivered instruction books explaining the use of the securing screws. Continual delays in the delivery of the antenna systems are due to the inability of the supplier of semiflexible coaxial cable to deliver within scheduled times. [Redacted] has agreed to ship the antenna systems with RG-8/U cable and to supply semiflexible coaxial cable at a later date when it is received from the manufacturer. Considerable improvement has been shown in the mechanical work done on the foamed feed structures. The faces of the pyramid feed structure are now smooth and continuous in contrast to the first model, which showed considerable roughness.

3. Contract 605, Task 2, CS-8 Antenna System. This project is almost completed. The one antenna called for in the task has been delivered and the instruction books are in publication.

4. Contract 605, Task 4, Parabolic Reflectors and Feeds. From [Redacted] standpoint this project is progressing satisfactorily. Continual delays in delivery of the antennas are once again due to the inability of the supplier to deliver semiflexible coaxial cable. This antenna system will be supplied with RG-8/U cable until the semiflexible cable becomes available. The feed structures for the system show considerable improvement in manufacture, being smoother than the first model.

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5. Contract 605, Task 6, 30 to 1000 mcs Antenna System.

Several models of log periodic antenna structures have been constructed to cover a 33:1 bandwidth. A new development has reduced the VSWR of the structure to less than 1.5:1 over an operating range of 500 to 10,000 mcs of the model. The new structure also exhibits a characteristic impedance of 50 ohms contrasted to 150 to 200 ohms in previous structures. The new structure consists of two printed circuit boards with antenna elements printed on one side of each board. The two boards are clamped together with the printed elements on the outside. The elements are then fed with coax line at the apex of the structure. Although no mathematical analysis of these structures has been made, [REDACTED] feels certain that the use of two separate boards rather than one thick board is the secret to the excellent operation of the antenna. When the model antenna is suitably expanded to cover the range of 30 to 1000 mcs, a gain of about 10 db/isotropic should result with VSWR less than 1.5:1 over the entire range. [REDACTED] has requested that the requirement for the 150 ohm balanced feed be removed since the structure is now inherently 50 ohms unbalanced and the addition of tapered lines to transform the impedance to 150 ohms will not only increase the cost and time required for completion of the antennas, but will also degrade the system performance somewhat.

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6. Contract 605, Task 8, Antenna-Filter-Detector System.

Very little work has been done on this project in the last two months. Recent developments in the reduction on VSWR and impedance of Log Periodic antennas will improve the final results obtainable in this system considerably. The problem of providing a bias return for the log periodic antenna is extremely simple. All that is required is to electrically short-circuit the back of the two planes of the log periodic structure. This procedure will in no way affect the RF operation of the antenna structure and will provide a DC return for the detector.

7. A conversation was held with [REDACTED]

[REDACTED] to discuss possible development of a 1 to 10 kmc battery operated receiver and a frequency determining device for use with crystal video systems. Basic requirements for a 1 to 10 kmc receiver were given as follows: Coverage - 1 to 10 kmc; sensitivity - -65 dbm pulse; manually tuned; single band; battery operated; maximum size - 10" x 12" x 4"; 1% frequency indication; and pulse widths from .2 microseconds to 10 microseconds. [REDACTED] suggested an approach such as that used in the APR-9 receiver, but finally decided that the circuitry could not be packed into the size required. Although he came up with nothing concrete in the time available, he stated that his department would be very interested in undertaking such a development. He suggests that information be obtained on the AN/BLR-1 and AN/WLR-1 receivers through [REDACTED] of [REDACTED]. These receivers cover the frequency range of interest and

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would be indicative of the approach used by [] in the design of a small receiver covering 1 to 10 kmcs. About the only concrete suggestion [] had concerning the construction of a frequency determining device for use with crystal video receivers was the possible use of a low pass filter which would be varied in cutoff frequency. To determine the frequency of an incoming signal, the cutoff point of the filter would be changed until the signal disappeared. This change might be effected through the use of parametric devices inserted in the filter to change the electrical constants of the filter in proportion to a manually controllable voltage source. Once again, he stated that his department would be very interested in undertaking a development of this sort.

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8. [] inquired as to the status of the study program which [] proposed some time ago. He was told that due to present lack of money, the possibility of the program being completed for some time was quite remote. He then stated that as far as he was concerned the proposal was good indefinitely, as there was no expiration date given. [] was also told that the mesh parabola system probably would not be funded for some time. According to [], this proposal is also still valid. [] indicated some displeasure regarding their writing of proposals for a supposed valid requirement and then never hearing about the disposition of the proposal. He requested that closer liaison be provided in the future so that they might better plan their programs.

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9. [] was asked about construction of 100 each 500 to 1000 and 1000 to 10,000 mcs Log Periodic antennas on a QRF basis. He stated that they could deliver the antennas in four months from the date of contract, but that his contract people were somewhat upset over the way that the 1 to 10 kmcs D/F antenna project was handled, and that they would not move this time until complete paper work was in their hands. He stated that as soon as we can formulate the requirement on paper and get it to him, [] will submit a proposal for the construction of the systems. [] feels that it will be necessary to include some R&D in the cost of the antennas to further improve their operation.

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10. [] recently issued proposal [] for the construction of a folding log periodic antenna system covering the range of 225 to 600 mcs with one antenna, and 50 to 600 mcs with another.

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[] The antenna will feature linear horizontal or vertical polarization, or right or left hand circular polarization. Unfolded it will resemble two CS-8 antennas placed with their principle planes at right angles to each other to form a pyramid.

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Folded, the antenna will be roughly rectangular in shape, perhaps 1' x 1' x 5'. This is first attempt to build an antenna of this type.

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cc: R+D Subject File
R+D Lab
Monthly (2)
EP Chrono

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